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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/620,162 | 07/20/2000 | Thomas H. Baum | 249-Div. | 2598 |
| | 7590 | | | |
| | 03/22/2004 | | | |
| Oliver A Zitzmann Advanced Technology Materials Inc 7 Commerce Drive Danbury, CT 06810 | | | EXAMINER MARKHAM, WESLEY D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1762 | |

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/620,162

Applicant(s)

BAUM ET AL.

Examiner

Wesley D Markham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-17, 19, 21 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-17, 19, 21 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of the amendment filed by the applicant on 12/22/2003, in which Claim 28 was amended. Claims 1 – 5, 7 – 17, 19, 21, and 28 – 30 are currently pending in U.S. Application Serial No. 09/620,162, and an Office Action on the merits follows.

Drawings

2. The formal drawings (12 sheets, 12 figures) filed on 7/20/2000 are approved by the examiner.

Claim Objections

3. The objection to Claim 28, set forth in paragraph 3 of the previous Office Action (i.e., the non-final Office Action mailed on 6/24/2003), is maintained. Specifically, in the **Remarks** section of the response filed by the applicant on 12/22/2003, the applicant indicates that the typographical error in Claim 28 was corrected. However, in the complete listing of the claims section, the typographical error (i.e., the "14" at the end of the claim) is still present, and therefore the objection to Claim 28 is maintained. Additionally, the examiner notes that the status identifiers used by the applicant in the complete listing of the claims section do not correspond to the status identifiers permitted by the new amendment practice. The only status identifiers permitted are "original", "currently amended", "canceled", "withdrawn", "new", "previously

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presented", and "not entered" (i.e., not "previously amended", "previously canceled", "currently amended, previously added", or "previously added"), and the correct status identifiers should be used in all future correspondence.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1 – 4, 7 – 17, 19, 21, and 28 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al. (USPN 5,461,308) in view of Li et al. (USPN

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5,487,356) for the reasons set forth in paragraphs 8 – 10 of the previous Office Action.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al. (USPN 5,461,308) in view of Li et al. (USPN 5,487,356), and in further view of Vaartstra (USPN 6,010,969) and Biagini et al. (USPN 5,659,101) for the reasons set forth in paragraphs 11 – 12 of the previous Office Action.

Response to Arguments

8. Applicant's arguments filed on 12/22/2003 have been fully considered but they are not persuasive.
9. First, the applicant states that Jin teaches a method of forming a $(\text{La}_{0.67}\text{Ca}_{0.33})\text{MnO}_x$ magnetoresistive material by laser ablation using a target of the same composition, and Li is directed to a CVD method of forming films showing a giant magnetoresistance, wherein such films are described as $(\text{La}_{1-x}\text{A}_x)\text{MnO}_3$, where $x + y = 1$. The applicant then summarizes the present invention as delineated in independent Claim 1, stating, in part, that the claim is directed to a liquid delivery CVD method of making **A-site deficient** manganate materials having a **Curie temperature that is between 273 K and 334 K** (emphasis added by applicant). The applicant argues that (1) these materials were heretofore unknown, and (2) Jin provides no basis or evidence for teaching materials having Curie temperatures of greater than or equal to 330 K, as stated by the examiner in the previous Office

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Action. The applicant then concludes by arguing that neither Jin nor Li, singly or in combination, teach or suggest the existence of A-site deficient manganate thin films having Curie temperatures that are at or above room temperature, and therefore do not teach or suggest all the limitations of the claims.

10. In response, this argument is not convincing for the following reasons. First, the examiner begins by agreeing that Jin teaches a method of forming a $(\text{La}_{0.67}\text{Ca}_{0.33})\text{MnO}_x$ magnetoresistive material by laser ablation and Li teaches a CVD method of forming films showing a giant magnetoresistance, wherein such films are described as $(\text{La}_{1-x}\text{A}_x)\text{MnO}_3$, where $x + y = 1$. However, these teachings are simply exemplary and do not fully describe or depict the overall teachings of Jin or Li, alone or in combination. Please note that the teachings of a reference are not limited to preferred or exemplary embodiments. Second, the examiner disagrees with the applicant's statement that A-site deficient manganate materials having a Curie temperature that is between 273 K and 334 K were heretofore unknown.

Specifically, Jin teaches a method of forming a magnetoresistive, doped manganate material "21" on a substrate "20" (Figure 2 and Col.2, lines 11 – 19) by a technique such as chemical vapor deposition (Col.2, lines 41 – 46), the manganate material having the general formula $\text{A}_w\text{B}_x\text{C}_y\text{O}_z$, where A is preferably La (as claimed by the applicant); B is preferably Mg, Ca, Sr, or Ba (as claimed by the applicant); C is preferably Mn (as claimed by the applicant); $0.5 \leq w \leq 0.7$; $0.15 \leq x \leq 0.50$; $0.8 \leq y \leq 1.2$; and $2.7 \leq z \leq 3.3$ (Col.3, lines 33 – 44). Further, the range of "y" values (i.e., the stoichiometric value of Mn) taught by Jin et al. (i.e., 0.8 to 1.2) encompasses the

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applicant's claimed stoichiometric value of Mn (i.e., 1), and the range of "z" values (i.e., the stoichiometric value of O) taught by Jin et al. (i.e., 2.7 to 3.3) encompasses the applicant's claimed stoichiometric value of O (i.e., 3). Jin et al. does not explicitly teach that the A-site filling value (i.e., the sum of "w + x" as defined in Jin et al., or, in the applicant's claimed terms, the sum of "x + y") is between 0.5 and 0.9 (i.e., that the materials are "A-site deficient" to the extent claimed by the applicant). However, the ranges of "w" and "x" taught by Jin et al. lead to an A-site filling value of between 0.5 and 0.9, and thus the A-site deficient manganate material of the applicant's claims. For example, if the "x" value of Jin et al. (i.e., the stoichiometric value of Mg, Ca, Sr, or Ba) is chosen to be 0.15 (a preferred embodiment of Jin et al.) and the "w" value of Jin et al. (i.e., the stoichiometric value of La) is chosen to be any value from 0.5 to 0.7, inclusive, as preferred by Jin et al., an A-site filling value of from 0.65 to 0.85 is obtained. This value is within / encompassed by the applicant's claimed "x + y" value of between 0.5 and 0.9. Please note that, in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists (*In re Wertheim* 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)). Also, a prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case of obviousness (*In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003)). As such, although Jin does not explicitly use the term "A-site deficient" for the manganate material(s), the preferred stoichiometry of the aforementioned material(s) leads to an A-site filling

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value squarely within the range claimed by the applicant, thereby teaching A-site deficient manganate materials as claimed by the applicant. Regarding the Curie temperature limitation, Jin states, in part, that, "While the invention has been described in relation to a preferred magnetoresistive material, more generally the sensor material can be any magnetoresistive material having a high electrical resistivity" (Col.3, lines 16 – 19), and "The material should also have a ferromagnetic Curie temperature higher than the sensor operating temperature, preferably by at least 30° C. Thus for room temperature operation, the material should have a Curie temperature $\geq 330^{\circ}$ K. (new paragraph) Suitable magnetoresistive films can be made of compounds of the form $A_wB_xC_yO_z$ where A is chosen from..." (Col.3, lines 33 – 42). These statements by Jin clearly teach and/or suggest that the magnetoresistive films having the stoichiometry taught by Jin (i.e., the A-site deficient stoichiometry discussed above) have a Curie temperature of ≥ 330 K, which is a value within the range claimed by the applicant. Further, even assuming, *arguendo*, that Jin does not explicitly teach the applicant's claimed Curie temperature limitation, the composition of the manganate material taught (or at least reasonably suggested) by Jin is identical to the manganate material of the applicant's claims. Therefore, the A-site deficient manganate films taught by Jin would inherently have a Curie temperature in the range claimed by the applicant (i.e., because the compositions / stoichiometry of the films are the same, and the Curie temperature of a material is simply a function of its composition and

stoichiometry). To conclude, the examiner has clearly shown that the combination of Jin and Li teaches all the limitations of the applicant's claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



WDM

Wesley D Markham
Examiner
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MICHAEL BARR
PRIMARY EXAMINER